Amir Marshal

+1 (647) 761-7122 | amir.marshalpirgheybi@uwaterloo.ca | linkedin.com/in/amirmarshal | Personal Website

Education

University of Waterloo Sep 2024 – Present
MASc in Management Sciences and Engineering (GPA: 91/100) *Waterloo, Canada*

Sharif University of Technology Sep 2019 – Aug 2024
BSc in Electrical Engineering (GPA:19.05/20) *Tehran, Iran*

Research Interests

Optimization, Stochastic Processes, Queuing Theory, Reinforcement Learning, Dynamic Programming, Scheduling, Optimal Transport, Information Theory

Experience

Graduate Research Assistant Sep 2024 – Present
University of Waterloo *Waterloo, Canada*

- Worked under the supervision of Professors. Hossein Abouee Mehrizi and Nasser Barjesteh
- Developed a scheduling and control policy for multi-calss multi server stochastic processing networks with wait-time dependent transitions using the so-called heavy-traffic analysis. We solved the corresponding stochastic control problem under the complete resource pooling assumption and proved the optimality of the proposed policy by using Ito's lemma.
- Validated the theoretical results by extensive Monte Carlo simulations on the Trillium HPC.
- Currently working on developing RL-based scheduling and control policies for general multi-class multi-server stochastic processing networks with unknown parameters and mathematical guarantees behind them.

Undergraduate Research Assistant Sep 2022 – Aug 2024
Sharif University of Technology *Tehran, Iran*

- Worked under the supervision of Professor. Mohammad Hossein Yasayee. Explored foundational concepts in quantum computation and information, focusing on their theoretical applications in machine learning and complexity theory.
- Studied optimal transport theory, including key results such as *Kantorovich duality*, *Brenier's theorem*, and *McCann's displacement convexity*, with emphasis on their role in analyzing probabilistic couplings and distributional distances.
- Investigated the link between *transport inequalities* (e.g., *Talagrand's T_2 inequality*, *Bobkov–Götze lemma*) and concentration of measure, highlighting their applications to generalization bounds and stability in learning theory.

Undergraduate Research Assistant Sep 2023 – Aug 2024
University of Waterloo *Waterloo, Canada*

- Worked under the supervision of Professor. Ali Ghodsi where I preprocessed and curated a large-scale dataset of Persian poetry, ensuring data consistency, accuracy, and stylistic completeness.
- Developed methods to balance poetic forms and integrated International Phonetic Alphabet (IPA) annotations to enhance the model's understanding of rhythm, phonetic structure, and meter.
- Fine-tuned a GPT-3 language model for Persian poem generation using Proximal Policy Optimization (PPO) and Direct Preference Optimization (DPO), improving the linguistic and stylistic quality of generated verses.

Publications

Dynamic Control of Multiclass Multi-Episode Service Systems with Waiting-Time-Dependent Transitions *with Hossein Abouee-Mehrizi, Nasser Barjasteh, and Brendan Wylie-Toal* (Working Paper, 2025)

Honors and Awards

- **Graduate Research Scholarship**, *Management Sciences and Engineering, University of Waterloo* *2024*
- **Ranked 3rd among 150 Electrical Engineering students**, Sharif University of Technology 2024
- **Silver Medal**, *International Olympiad on Astronomy and Astrophysics, Hungury* *2019*
- **Gold Medal**, *Iranian National Olympiad on Astronomy and Astrophysics* *2018*

Teaching Experience

Teaching Assistant Sep 2024 – Present
University of Waterloo *Waterloo, Canada*

- MSE 271: Advanced Calculus and Numerical Methods
- MSE 261: Engineering Economics
- MSE 719: Operation Analytics
- MSE 333: Simulation Analysis and Design

Teaching Assistant Sep 2022 – Aug 2024
Sharif University of Technology *Tehran, Iran*

- Convex Optimization I
- Probability and Statistics
- Introduction to Machine Learning
- Information Theory, Statistics, and Learning

Related Coursework

University of Waterloo
Deterministic Models for Operation Research, Probablistic Models for Operation Research, Theory of Probability

Sharif University of Technology
Convex Optimization, Introduction to Machine Learning, ITSL (Information Theory, Statistics, and Learning), High Dimensional Probability, Big Data, Graph Signal Processing

Technical Skills

Programming Languages: Java, Python, C/C++, SQL, R, MATLAB
Frameworks & Libraries: PyTorch, TensorFlow, Numpy, Pandas, PySpark, Eigen, NLopt, Gurobi
Tools & Environments: LaTeX, CUDA, OpenCL, GitHub, Linux, Bash

Service

Vice President, CORS Student Chapter, University of Waterloo *2025–Present*
Organizing academic and professional development events for graduate students in Operations Research and Management Sciences.

Event Coordinator, Resana Association, Sharif University of Technology *2024*
Assisted in organizing the React Conference 2024 for the Electrical Engineering Department, coordinating speaker sessions.

References

Prof. Hossein Abouee Mehrizi
Professor, Management Sciences and Engineering, University of Waterloo
hossein.abouee@uwaterloo.ca

Prof. Nasser Barjesteh
Assistant Professor, Rotman School of Management, University of Toronto
nasser.barjesteh@rotman.utoronto.ca

Prof. Hassan Shavandi
Assistant Professor , Management Science and Engineering, University of Waterloo
hassan.shavandi@uwaterloo.ca